

THREE NEW SPECIES OF *FIPPATALEYRODES* SUNDARARAJ AND DAVID
(ALEYRODIDAE: HEMIPTERA) FROM WESTERN GHATS OF SOUTH INDIA¹

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The Whitefly genus *Fippataleyrodes* Sundararaj and David was represented in India, so far, by two species. Three new species of *Fippataleyrodes*, namely *F. cinnamomi*, *F. multipori* and *F. yellapurensis*, breeding in the Western Ghats of southern India, have been described here. A key to the Indian species of the genus is given.

Key words: Aleyrodidae, *Fippataleyrodes*, new species

INTRODUCTION

Sundararaj and David (1992) erected the genus *Fippataleyrodes* for the Whitefly species *F. indicus* Sundararaj & David and *F. litseae* Sundararaj & David with the former being the type species. In the present study, we collected five species of whiteflies of genus *Fippataleyrodes* breeding in the Western Ghats of southern India, of which three were new species. The new species are described and illustrated. A key to the Indian species of the genus *Fippataleyrodes* is given.

1. *Fippataleyrodes cinnamomi* sp. nov.

(Figs 1-4)

Material examined: Holotype: INDIA: Karnataka: Kumargiri, one puparium, on *Cinnamomum malabattrum*, 10.ix.2001, A.K. Dubey, deposited in the collections of Forest Entomology Museum, Forest Research Institute, Dehradun, India. **Paratype:** One puparium, data same as holotype, deposited in the collections of Natural History Museum, London, United Kingdom.

Description

Puparium: White, without secretion of wax; oval, broadest at metathoracic region, 1.92-1.96 mm long, 1.54-1.62 mm wide; found singly on the under surface of leaves. Margin smoothly crenulate, 32-33 crenulations in 0.1 mm; thoracic and caudal tracheal pore areas not differentiated from margin. Anterior and posterior marginal setae present.

Dorsum: Dorsum completely tuberculate, fine tubercles in between the large tubercles. Cephalothorax with six pairs of tubercles on submedian area – three pairs on prothorax in a group, one pair on mesothorax and two pairs on metathorax, seven pairs of tubercles laterad of abdominal segment III-

VIII, in which third abdominal segment with two pairs of tubercles. Longitudinal moulting suture reaching margin and transverse moulting suture reaching subdorsum. Submarginal lines evident, two to three faint broken lines running from cephalus to posterior caudal region on submarginal area. Submedian pockets with depressions present on all the cephalothoracic and abdominal segment sutures. Median length of abdominal segment VII (76 µm) longer than VIII (60 µm). Pockets on eighth abdominal segment not discernible.

Chaetotaxy: Cephalic setae 2 µm long, first abdominal setae 15 µm long, eighth abdominal setae cephalolaterad of vasiform orifice 14 µm long and caudal setae absent. Eight pairs of short capitate setae arranged in a tier- two pairs on cephalothorax (one pair each on mesothorax and metathorax) and six pairs on abdomen (one pair on second abdominal segment and one pair each on abdominal segments IV-VIII), 20 µm long. Vasiform orifice cordate, notched at caudal end, 44-45 µm long, 45-46 µm wide; operculum subcordate, 32-33 µm long, 30-31 µm wide. Thoracic tracheal furrows absent while caudal tracheal furrow indicated, which is incomplete at caudal end.

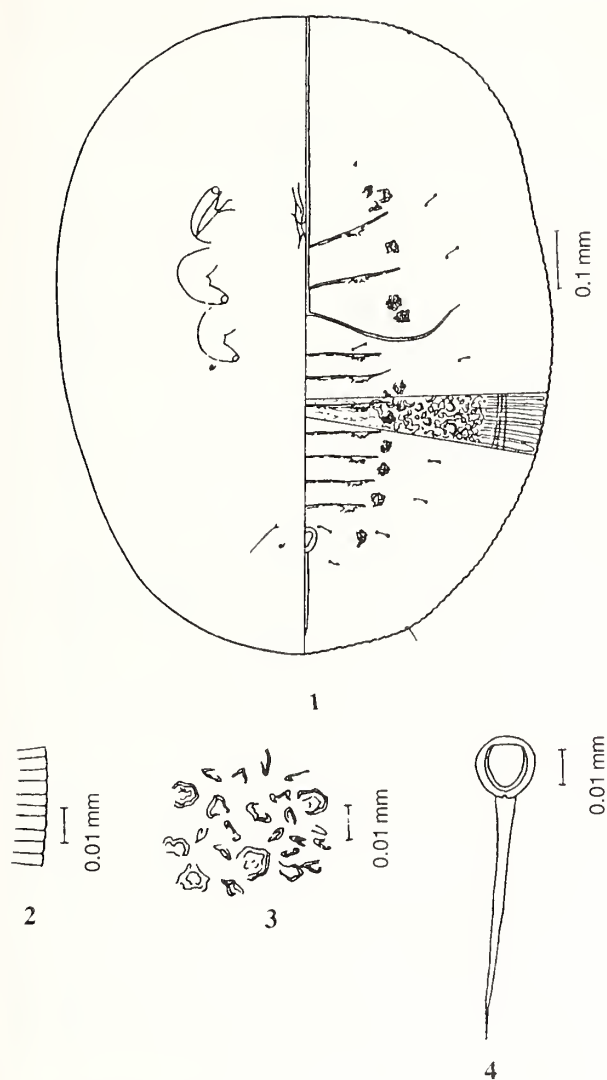
Venter: Paired ventral abdominal setae 25 µm long, 60-76 µm apart. Thoracic and caudal tracheal folds absent. Antennae reaching base of prothoracic legs.

Host: *Cinnamomum malabattrum*.

Distribution: INDIA: Karnataka.

Etymology: Named after its host plant genus *Cinnamomum*.

Comments: This species resembles *F. litseae* Sundararaj & David in the presence of submedian tubercles on cephalothorax and abdomen, and subdorsal capitate setae, but differs in having more number of subdorsal capitate setae, distinct tuberculate dorsum, notched vasiform orifice and incomplete caudal furrow.



Figs 1-4: *Fippataleyrodes cinnamomi* sp. nov.,
1. Puparium, 2. Margin, 3. Tubercles, 4. Vasiform orifice

2. *Fippataleyrodes indicus* Sundararaj & David

Fippataleyrodes iudicus Sundararaj & David 1992.
Reichenbachia 29(40): 16-20.

Material examined: INDIA: Karnataka: Kudremukh National Park, 6 puparia, on *Nothopegia* sp., 12.viii.2001, A.K. Dubey; Goa: Kulem, 9 puparia, on *Litsea* sp., 9.viii.2001, A.K. Dubey. (Specimens deposited in the collections of Institute of Wood Science & Technology, Bangalore).

Hosts: *Litsea* sp., *Nothopegia* sp. (Sundararaj and David 1992).

Distribution: INDIA: Tamil Nadu (Sundararaj and David 1992), Goa, Karnataka (new distribution record).

3. *Fippataleyrodes litseae* Sundararaj & David

Fippataleyrodes litseae Sundararaj & David 1992.
Reichenbachia 29(40): 16-20.

Material examined: INDIA: Karnataka: Kudremukh, 10 puparia, on *Litsea* sp., 11.viii.2001, A.K. Dubey.

Hosts: *Litsea stocksii* (Sundararaj and David 1992), *Ficus racemosa*, *Hyduocarpus alpinus*, *Litsea glabrata*, *Rapauea wightiana* (Meganathan and David 1994), *Litsea* sp.

Distribution: INDIA: Maharashtra (Sundararaj and David 1992), Kerala (Meganathan and David 1994), Karnataka (new distribution record).

4. *Fippataleyrodes multipori* sp. nov.

(Figs 5-9)

Material examined: Holotype: INDIA: Karnataka: Bandipur National Park; one puparium, on unidentified plant, 11.x.2002, A.K. Dubey, deposited in the collections of Forest Entomology Museum, Forest Research Institute, Dehradun, India. **Paratype:** One puparium, data same as holotype, deposited in the collections of Natural History Museum, London, United Kingdom.

Description

Puparium: White, with secretion of white wax; oval, broadest at first abdominal segment; 2.04-2.07 mm long, 1.56-1.60 mm wide; found singly on the under surface of leaves. Margin crenulate, crenulations in 0.1 mm; thoracic and caudal tracheal pore areas not differentiated from margin.

Dorsum: Tassellated. Longitudinal moulting suture faintly discernible on submargin and merging with submarginal lines and transverse moulting suture merging with tassellations on subdorsum. Submarginal lines evident. Submedian pockets on cephalothoracic and abdominal segments slightly discernible while submedian depressions on all the segments prominent.

Chaetotaxy: Cephalic and first abdominal setae fimbriate, 9 μ m long, eighth abdominal setae pointed, cephalolaterad of vasiform orifice 14 μ m long and caudal setae 49-62 μ m long. A pair of minute setae cephalolaterad of caudal setae present, 10 μ m long. Subdorsum with a row of eight pairs of fimbriate setae, three pairs on cephalothorax, one pair each on pro-, meso- and metathorax and five pairs on abdomen, 7-10 μ m long. A row of 12 pairs of setae present on submargin, 29-40 μ m long. Vasiform orifice subcordate, 48-50 μ m long, 54-72 μ m wide, slightly notched at caudal end; operculum subcordate, 28-29 μ m long, 34-38 μ m wide. Tip of lingula exposed and included. Thoracic tracheal furrows absent while caudal tracheal furrow indicated with sculptures or tassellations, 396 μ m long, 56 μ m wide at its widest end.

Venter: Paired ventral abdominal setae 34 μ m long, 58-60 μ m apart. Thoracic tracheal folds not indicated, while

and porettes on dorsum and absence of submedian row of papillae.

5. *Fippataleyrodes yellapurensis* sp. nov.

(Figs 10-12)

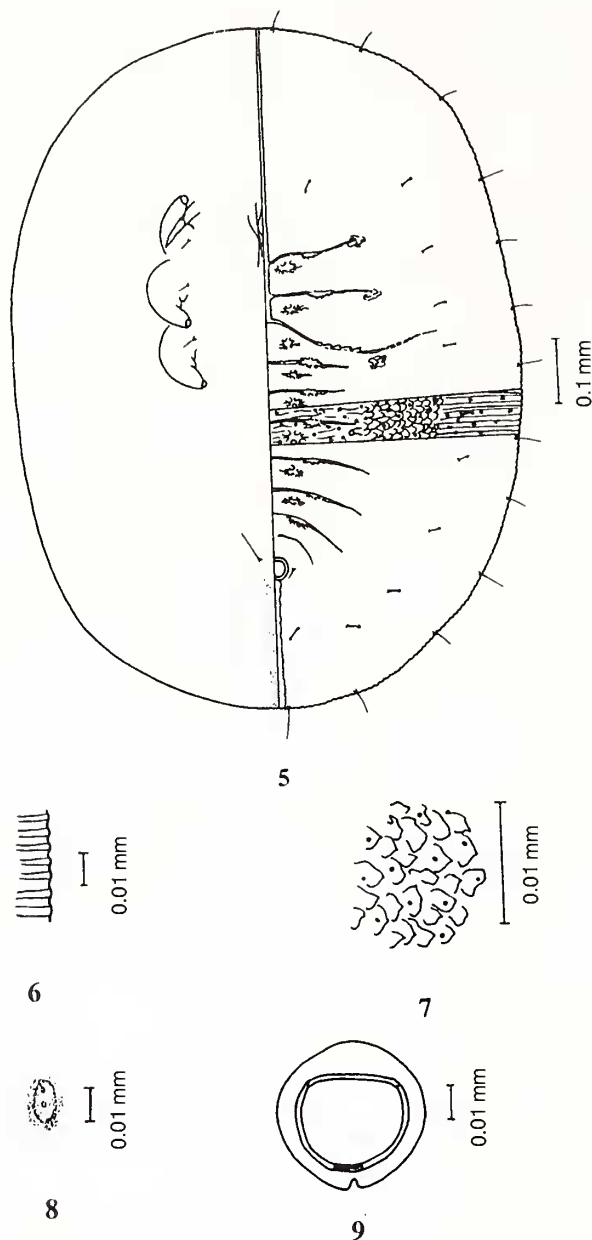
Material examined: **Holotype:** INDIA: Karnataka: Yellapur, one puparium, on unidentified plant, 11.x.2001, A.K. Dubey, deposited in the collections of Forest Entomology Museum, Forest Research Institute, Dehradun, India. **Paratypes:** 8 puparia, data same as holotype, deposited one each in the collections of Australian National Insect Collection, CSIRO Entomology, Canberra, ACT, Australia; Natural History Museum, London, United Kingdom; Indian Agricultural Research Institute, New Delhi, India; National Museum of Natural History, Tel Aviv University, Israel; National Taiwan University, Taipei, Taiwan 107, Republic of China; Staatliches Museum für Tierkunde, Dresden, Germany; Systematic Entomology Laboratory, U.S. Department of Agriculture, Beltsville, Maryland, USA; Zoological Museum, Universitetsparken, Department of Zoology, Denmark.

Description

Puparium: White, without wax secretion; elongate oval, widest across the first abdominal segment; 0.96-1.26 mm long, 0.60-0.86 mm wide; found singly on the under surface of leaves. Margin irregularly crenulate, 24-30 crenulations in 0.1 mm; thoracic tracheal pore regions not indicated while caudal tracheal pore region indicated by deep invagination. Anterior and posterior marginal setae 35 μ m and 42 μ m long respectively.

Dorsum: Tuberculated, mostly crescent-shaped and scattered in irregular manner. Submarginal area free from tubercles. Median tubercles on abdominal segments I-VII distinct. Longitudinal moulting suture not discernible. Transverse moulting suture reaching outer submedian area. Submedian pockets present on all the abdominal segment sutures. Submedian depressions present on all the abdominal segments. Pores and porettes not discernible.

Chaetotaxy: Dorsum with four pairs of capitate setae with distinct bases - cephalic setae 304 μ m long, first abdominal setae 312 μ m long, eighth abdominal setae cephalolaterad of vasiform orifice, 106 μ m long and caudal setae 60 μ m long. Subdorsum with 10 pairs of long capitate setae arising from distinct subtriangular bases - 5 pairs each on cephalothorax and abdomen, 126-242 μ m long. Vasiform orifice subcircular, 62-76 μ m long, 58-78 μ m wide, notched at caudal end; operculum subcordate, 41-52 μ m long, 38-51 μ m wide; filling orifice and obscuring lingula. Thoracic tracheal furrows not indicated while caudal tracheal furrow faintly indicated.



Figs 5-9: *Fippataleyrodes multipori* sp. nov.,

5. Puparium, 6. Margin, 7. Tassellation, 8. Dorsal pore, 9. Vasiform orifice

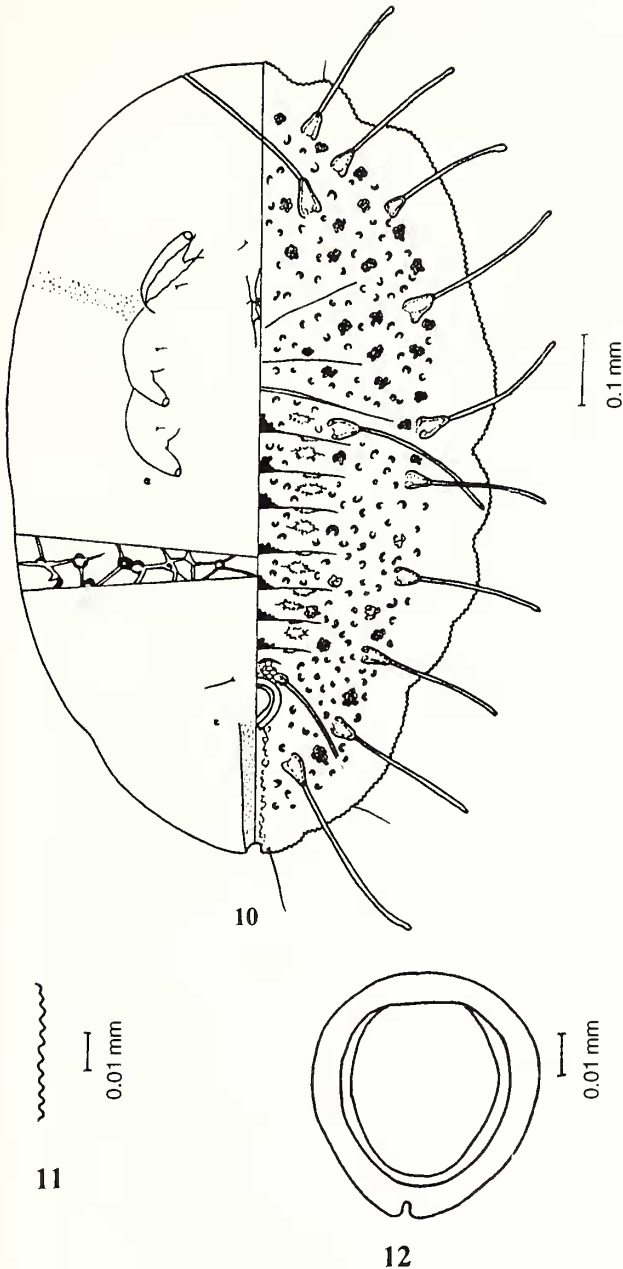
caudal tracheal fold indicated with stipples. Antennae reaching base of prothoracic legs. A pair of minute setae at base of pro-, meso- and metathorax present, 6 μ m long. A pair of minute setae at base of rostrum 9 μ m long.

Host: Unidentified plant.

Distribution: INDIA: Karnataka.

Etymology: Named to reflect its distinct pores and porettes scattered on dorsum.

Comments: This species resembles *F. litseae* Sundararaj & David in the presence of subdorsal setae, but differs in shape and in the presence of submarginal setae, distinct pores



Figs 10-12: *Fippataleyrodes yellapurensis* sp. nov.,
10. Puparium, 11. Margin, 12. Vasiform orifice

Venter: Paired ventral abdominal setae 35 μ m long, 26-36 μ m apart; caudal and thoracic tracheal folds with stipples, stipples in thoracic tracheal folds extending up to prothoracic legs. A pair of minute of setae at base of pro-, meso- and

metathoracic legs, 6 μ m long. Antennae reaching base of prothoracic legs.

Host: Unidentified plant.

Distribution: INDIA: Karnataka.

Etymology: Named after its collection site, Yellapur.

Comments: This species resembles *F. litseae* Sundararaj & David in having tuberculate dorsum and capitate setae, but differs in the presence of long and less number of subdorsal setae and median tubercles on abdominal segments.

KEY TO THE INDIAN SPECIES OF *FIPPATALEYRODES*

1. Abdominal segments without median tubercles; cephalic and first abdominal setae short 2-37.5 μ m long 2
- Abdominal segments with median tubercles; cephalic setae 304 μ m and first abdominal setae 312 μ m long
..... *yellapurensis* sp. nov.
2. Submarginal setae pointed 3
- Submarginal setae absent, if present capitate 4
3. A row of submedian papillae present; submargin with 12 pairs of setae; dorsum with distinct pores
..... *multi pori* sp. nov.
- A row of submedian papillae absent; submargin with 14 pairs of setae; dorsum without distinct pores
..... *indicus* (Sundararaj & David 1992)
4. Submargin with 8 pairs of setae; caudal tracheal pore not indicated; vasiform orifice notched at caudal end; caudal furrow incomplete *cinnamomi* sp. nov.
- Submargin with 13 pairs of setae; caudal tracheal pore indicated; vasiform orifice not notched at caudal end; caudal furrow complete
..... *litseae* (Sundararaj & David 1992)

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